

DISCUSSION OF THE AMENDMENT

The Abstract has been shortened and limited to a single paragraph.

Claim 1 has been amended to clarify particulars about the lithium ion conducting inorganic material. Claim 3 has been amended to clarify that the lithium ion conducting inorganic material is in addition to the coating. Claim 4 has been amended to be consistent with the amendment to Claim 1. Claim 6 has been amended by deleting the superfluous “oxide”.

No new matter is believed to have been added by the above amendment. Claims 1-25 remain pending in the application.

REMARKS

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2006/0166085, when discussing the application description, both in this section and in the Remarks section, *infra*, rather than to page and line of the specification as filed.

The rejection of Claims 1-12 and 14-21 under 35 U.S.C. § 102(b) as anticipated by WO 99/62620, corresponding to US 6,620,320 (Hyung et al), in view of US 5,254,416 (Kubota) and US 5,411,820 (Yamahira et al [sic, Chaloner-Gill]), is respectfully traversed.^{1,2}

As recited in Claim 1, an embodiment of the present invention is a separator for high power lithium batteries comprising a sheetlike flexible substrate having a multiplicity of openings and having a porous inorganic electrically insulating coating on and in said substrate, said coating closing the openings in the substrate, the material of said substrate being selected from non-woven electrically nonconductive polymeric fibers and said inorganic electrically insulating coating comprising particles, wherein the separator is an electrical insulator and has lithium ion conducting properties without the presence of an electrolyte and wherein the separator comprises at least one lithium ion conducting inorganic material which may also contain organic groups and which lithium ion conducting inorganic material is chemically bonded to the inorganic coating.

As described in the specification at paragraph [0017], surprisingly, it has now been found that a further marked increase in the performance of a separator or battery system can

¹ That the new prior art, i.e., Kubota and Chaloner-Gill, is not listed in the statement of the rejection is irrelevant; reliance thereon is all that is necessary. “Where a reference is relied on to support a rejection, whether or not in a ‘minor capacity,’ there would appear to be no excuse for not positively including the reference in the statement of rejection.” *In re Hoch*, 428 F.2d 1341, 166 USPQ 406, 407 n.3 (CCPA 1970). See also MPEP 706.02(j).

² The Examiner identifies US 5,411,820 as “Yamahira et al” although the listed inventor’s last name is “Chaloner-Gill.” Thus, either the patent number or the name of the patentee is incorrect. In addition, neither Kubota nor Chaloner-Gill (if correct), has been listed on an appropriate Form PTO 892. The Examiner is respectfully requested to make these references, with any correction, if necessary, of record in the next Office communication.

be achieved by providing the pores of the separator with negative fixed charges, and that the production of an ion conducting composite material was described in Hyting et al; however, Hyting et al did not describe how such a composite material can be adapted in a few steps to form an outstanding separator for high power lithium batteries. Thus, the difference between Hyting et al and the present invention is that the present invention includes at least one lithium ion conducting inorganic material which may also contain organic groups and which material is chemically bonded to the inorganic coating. With the presence of the lithium ion conducting inorganic material, negative fixed charges are provided to the pores, as discussed above.

The Examiner appears to rely on Kubota as disclosing that a polysulfone is an electrical insulator and has lithium ion conductive properties without the presence of an electrolyte. Kubota discloses an electron conductive high polymer having a particular repeating unit of formula (1) therein, which polymer may be, *inter alia*, a sulfone derivative. However, Kubota does not disclose that their electron conductive high polymer is an electrical insulator. Nor does Chaloner-Gill shed any light with regard to a separate lithium ion conducting inorganic material which may also contain organic groups that is chemically bonded to an inorganic coating.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claim 13 under 35 U.S.C. § 103(a) as unpatentable over Hyting et al in view of US 6,828,065 (Munshi), is respectfully traversed. Contrary to the finding by the Examiner, Munshi does **not** disclose that flexibility of a separator is dependent on the thickness thereof. Nevertheless, even if the Examiner were correct about Munshi's disclosure, Munshi does not remedy the fundamental deficiencies in Hyting et al, discussed above. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 22-25 under 35 U.S.C. § 103(a) as unpatentable over Hyng et al., in further view of US 5,795,679 (Kawakami et al.), is respectfully traversed. Significantly, for the many utilities disclosed by Hyng et al. for their ion-conducting materials, the use as separators in batteries, including lithium batteries, is not disclosed. Indeed, it is only with the present disclosure as a guide that one of ordinary skill in the art would combine Kawakami et al. with Hyng et al. However, even if combined, Kawakami et al. would not remedy the above-discussed fundamental deficiencies of Hyng et al. Accordingly, it is respectfully requested that the rejection be withdrawn.

The objections to Claims 1, 3 and 4 are respectfully traversed. Indeed, the objections would now appear to be moot. Accordingly, it is respectfully requested that the objections be withdrawn.

The objection to the Abstract is now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that the objection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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